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Shasta Lake
Shasta County
California

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NATIONAL EUTROPHICATION SURVEY

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT
ON
SHASTA LAKE
SHASTA COUNTY
CALIFORNIA
EPA REGION IX
WORKING PAPER No. 757

WITH THE COOPERATION OF THE
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD
AND THE
CALIFORNIA NATIONAL GUARD
JUNE, 1978

CONTENTS

	Page
Foreword	ii
List of California Study Lakes	iv
Lake and Drainage Area Map	v
Sections	
I. Conclusions	1
II. Reservoir and Drainage Basin Characteristics	3
III. Water Quality Summary	4
IV. Nutrient Loadings	9
V. Literature Reviewed	14
VI. Appendices	15

FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentration (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the California State Water Resources Control Board and the nine Regional Water Quality Control Boards for professional involvement, to the California National Guard for conducting the tributary sampling phase of the Survey, and to those California wastewater treatment plant operators who voluntarily provided effluent samples and flow data.

The staff of the Division of Planning and Research of the State Water Resources Control Board provided invaluable lake documentation and counsel during the Survey, coordinated the reviews of the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

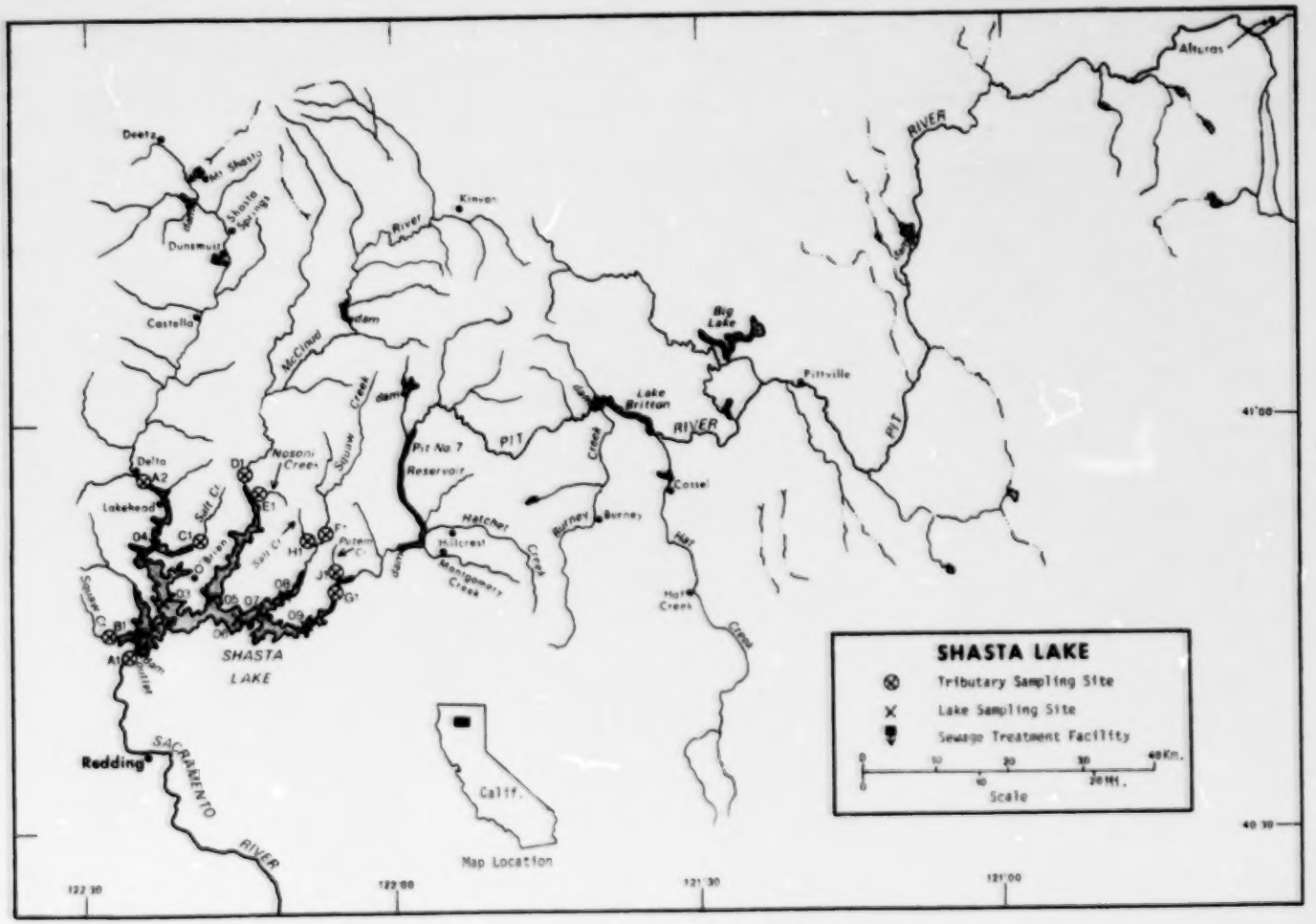
Major General Glen C. Ames, the Adjutant General of California, and Project Officer Second Lieutenant Terry L. Barrie, who directed the volunteer efforts of the California National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

State of California

Name	County
Amador	Amador
Boca	Nevada
Britton	Shasta
Casitas	Ventura
Crowley	Mono
Don Pedro	Tuolumne
Elsinore	Riverside
Fallen Leaf	El Dorado
Hennessey	Napa
Henshaw	San Diego
Iron Gate	Siskiyou
Lopez	San Luis Obispo
Mary	Mono
Mendocino	Mendocino
Nicasio	Marin
Lower Otay	San Diego
Pillsbury	Lake
Santa Margarita	San Luis Obispo
Shasta	Shasta
Shaver	Fresno
Silver	Mono
Tahoe	El Dorado, Placer, CA; Carson City, Douglas, Washoe, NV
Tulloch	Calaveras, Tuolumne
Lower Twin	Mono
Upper Twin	Mono


SHASTA LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Scale
Map Location
Calif.
Redding
SACRAMENTO RIVER
SHASTA LAKE
Pit No. 7 Reservoir
PIT RIVER
Big Lake
Lake Britton
Pittville
Alturas
Kinyon
Dunsmuir
Castella
Delta
Lakehead
Nosoni Creek
Squaw Creek
McCloud River
Hatchet Creek
Burney
Cassel
Hillcrest
Montgomery Creek
Hat Creek
Soda Cr.
Square Cr.
Salt Cr.
Putem Cr.
122 30
122 00
121 30
121 00
41 00
40 30

SHASTA LAKE

STORET NO. 0621

I. CONCLUSIONS

A. Trophic Condition*:

Survey data indicate that Shasta Lake is mesotrophic. It ranked tenth in overall trophic quality when the 24 California lakes and reservoirs sampled in 1975 were compared using a combination of six parameters**. Nine of the water bodies had less median total phosphorus, 16 had less median dissolved orthophosphorus, nine had less and five had the same median inorganic nitrogen, ten had less mean chlorophyll a, and nine had greater mean Secchi disc transparency. No significant depression of dissolved oxygen occurred at depths as great as 82 meters.

Survey limnologists did not observe macrophytes or surface concentrations of algae during sampling visits.

B. Rate-Limiting Nutrient:

The results of the algal assays are not considered representative of conditions in the reservoir because of significant changes in nutrients in the samples during shipment from the field to the laboratory.

The reservoir data indicate nitrogen limitation at all sampling stations and times.

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* Trophic assessment is based on levels of nutrients, dissolved oxygen, and chlorophyll a; phytoplankton kinds and numbers; and transparency (Allum et al., 1977).

** See Appendix A.

C. Nutrient Controllability:

1. Point sources--The cities of Dunsmuir and Mt. Shasta respectively contributed 0.7% and 0.6% of the total phosphorus load to the reservoir during the sampling year. Another point source, the City of Alturas, discharges treated wastes at a rate of nearly 1,150 m^3/day to the Pit River about 250 km upstream from Shasta Lake (Bailey, 1977; see map, page v). However, because of the distance and two intervening major reservoirs and several smaller hydroelectric dams it does not seem likely that Alturas contributes significant amounts of nutrients to the lake.

The present phosphorus loading of 3.05 g/m^2/yr is nearly two times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 13). On the basis of Survey data, it appears the trophic quality of Shasta Lake will deteriorate unless the phosphorus inputs can be reduced.

2. Non-point sources--Non-point sources, including direct precipitation, contributed 98.7% of the total phosphorus load. The Sacramento River added 10.4%; Salt Creek, 0.1%; McCloud River, 4.9%; Squaw Creek, 0.8%; the Pit River, 74.4%; and the ungaged tributaries contributed an estimated 7.5%.

The phosphorus export rates of the Sacramento River, Salt Creek (at C-1), McCloud River, Squaw Creek (at B-1), and the Pit River were 34, 15, 11, 18, and 21 kg/km^2/yr, respectively (see page 12). The somewhat higher export rate of the Sacramento River may be due to underestimation of the known point-source loads.

II. RESERVOIR AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 119.40 kilometers^2.
2. Mean depth: 46.5 meters.
3. Maximum depth: 148.4 meters.
4. Volume: 5,550.705 x 10^6 m^3.
5. Mean hydraulic retention time: 217 days.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Sacramento River	1,100.7	40.950
Salt Creek	35.0	0.854
McCloud River	1,585.1	26.750
Squaw Creek	158.0	6.310
Pit River	12,823.1	172.120
Minor tributaries & immediate drainage -	809.1	48.396
Totals	16,511.0	295.380**

2. Outlet -

Sacramento River	16,630.4**	295.380

C. Precipitation***:

1. Year of sampling: 94.8 centimeters.
2. Mean annual: 90.2 centimeters.

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† Table of metric conversions--Appendix B.
†† Dendy, 1974.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Includes area of reservoir; sum of inflows adjusted to equal outflow.
*** See Working Paper No. 175.

III. WATER QUALITY SUMMARY

Shasta Lake was sampled three times in 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at seven stations in March, eight stations in July, and nine stations in November (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first and last visits, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 73.2 meters at stations 1, 2, and 3; 42.7 meters at station 4; 70.1 meters at station 5; 82.3 meters at station 6; 49.1 meters at station 7; 56.7 meters at station 8; and 62.8 meters at station 9.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR SHASTA LAKE
STORET CODE 0621

PARAMETER	1ST SAMPLING (3/26/75) 7 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (7/14/75) 8 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (11/ 3/75) 9 SITES RANGE	MEAN	MEDIAN
TEMP (C)	7.6 - 9.6	8.9	9.0	6.5 - 25.3	16.2	15.1	11.0 - 17.6	16.4	17.2
DISS OXY (MG/L)	9.2 - 11.4	11.0	11.0	6.0 - 12.0	8.5	8.3	6.6 - 9.8	8.1	8.0
CNDCTVY (MCROMO)	73. - 137.	100.	105.	66. - 148.	105.	104.	66. - 121.	95.	93.
PH (STAND UNITS)	7.5 - 8.2	7.9	7.9	7.0 - 8.8	7.9	7.7	7.3 - 7.8	7.7	7.7
TOT ALK (MG/L)	35. - 61.	53.	54.	40. - 78.	56.	56.	37. - 69.	60.	59.
TOT P (MG/L)	0.017 - 0.066	0.028	0.022	0.006 - 0.048	0.021	0.020	0.010 - 0.077	0.024	0.021
ORTHO P (MG/L)	0.008 - 0.047	0.019	0.018	0.002 - 0.041	0.015	0.015	0.002 - 0.035	0.015	0.013
NO2+NO3 (MG/L)	0.020 - 0.510	0.061	0.060	0.020 - 0.170	0.047	0.030	0.020 - 0.100	0.035	0.020
AMMONIA (MG/L)	0.020 - 0.050	0.023	0.020	0.020 - 0.060	0.025	0.020	0.020 - 0.020	0.020	0.020
KJEL N (MG/L)	0.200 - 0.600	0.214	0.200	0.200 - 0.800	0.237	0.200	0.200 - 0.200	0.200	0.200
INORG N (MG/L)	0.040 - 0.530	0.084	0.060	0.040 - 0.200	0.072	0.060	0.040 - 0.120	0.055	0.040
TOTAL N (MG/L)	0.220 - 0.710	0.275	0.260	0.220 - 0.830	0.284	0.240	0.220 - 0.300	0.235	0.220
CHLRPYL A (UG/L)	1.3 - 5.9	3.2	3.0	0.7 - 2.5	1.2	0.9	1.9 - 29.0	7.4	3.4
SECCHI (METERS)	1.2 - 2.6	1.8	1.8	1.5 - 3.7	2.5	2.3	2.4 - 6.1	4.4	4.9

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
03/26/75	1. Stephanodiscus sp.	1,475
	2. Asterionella sp.	413
	3. Peridinium sp.	59
	4. Cryptomonas sp.	30
	Total	1,977
07/14/75	1. Cryptomonas sp.	85
	2. Synedra sp.	42
	3. Stephanodiscus sp.	42
	4. Chlorophytan colonies	42
	Total	211
11/03/75	1. Melosira sp.	637
	2. Synedra sp.	80
	3. Chroomonas (?) sp.	80
	Total	797

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
03/26/75	1	1.3
	2	1.6
	3	3.0
	4	3.3
	5	2.5
	6	5.9
	7	4.8
	8	-
	9	-
07/14/75	1	0.8
	2	0.7
	3	0.8
	4	1.0
	5	0.8
	6	1.4
	7	-
	8	1.4
	9	2.5
11/03/75	1	2.0
	2	17.0
	3	29.0
	4	1.9
	5	2.7
	6	4.0
	7	2.5
	8	3.8
	9	3.4

C. Limiting Nutrient Study:

The results of the algal assay are not considered representative of conditions in the reservoir at the times of sampling (03/26/75 and 11/03/75) because of significant nutrient changes in the

in the samples during shipment from the field to the laboratory.

The reservoir data indicate nitrogen limitation at all sampling stations and times. Following is a tabulation of the mean inorganic nitrogen/orthophosphorus ratios for each of the sampling stations and times with the indicated limiting nutrient in parentheses.

Station	03/26/75	07/14/75	11/03/75
1	4/1 (N)	6/1 (N)	3/1 (N)
2	4/1 (N)	5/1 (N)	3/1 (N)
3	5/1 (N)	5/1 (N)	4/1 (N)
4	4/1 (N)	7/1 (N)	8/1 (N)
5	5/1 (N)	4/1 (N)	5/1 (N)
6	4/1 (N)	3/1 (N)	3/1 (N)
7	3/1 (N)	-	3/1 (N)
8	-	6/1 (N)	11/1 (N)
9	-	5/1 (N)	3/1 (N)

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the California National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff month of May when two samples were collected. Sampling was begun in November, 1974, and was completed in October, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the California District Office of the U.S. Geological Survey for the tributary sites nearest the reservoir.

In this report, nutrient loads for sampled tributaries were calculated using mean annual concentrations and mean annual flows. Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the mean concentrations in Nosoni Creek at station E-1 and the mean annual ZZ flow.

The operators of the Dunsmuir and Mt. Shasta wastewater treatment plants provided monthly effluent samples and corresponding flow data; the City of Alturas did not participate but is not considered a significant contributor of nutrients to Lake Shasta (see page 2).

A. Waste Sources:

1. Known municipal -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Alturas*	3,130	tr. filter	1,135.5	Pit River
Dunsmuir**	2,450	stab. pond	1,732.0	Sacramento River
Mt. Shasta**	2,515	stab. pond	1,921.8	Sacramento River

2. Known industrial - None

* Anonymous, 1971.
** Treatment plant questionnaires.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Sacramento River	37,855	10.4
Salt Creek (C-1)	540	0.1
McCloud River	17,715	4.9
Squaw Creek (B-1)	2,785	0.8
Pit River	271,400	74.4
b. Minor tributaries & immediate drainage (non-point load) -	27,470	7.5
c. Known municipal STP's -		
Alturas	?	-
Dunsmuir	2,535	0.7
Mt. Shasta	2,225	0.6
d. Septic tanks - Unknown	?	-
e. Known industrial - None	-	-
f. Direct precipitation* -	2,090	0.6
Total	364,615	100.0

2. Outputs -

Reservoir outlet - Sacramento River 316,715

3. Net annual P accumulation - 47,900 kg.

* See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/ yr	% of total
a. Tributaries (non-point load) -		
Sacramento River	2,032,775	17.8
Salt Creek (C-1)	26,445	0.2
McCloud River	687,525	6.0
Squaw Creek (B-1)	116,810	1.0
Pit River	6,323,590	55.4
b. Minor tributaries & immediate drainage (non-point load) -	2,083,285	18.3
c. Known municipal STP's -		
Alturas	?	-
Dunsmuir	6,705	0.1
Mt. Shasta	6,095	0.1
d. Septic tanks - Unknown	?	-
e. Known industrial - None	-	-
f. Direct precipitation* -	128,905	1.1
Total	11,412,135	100.0

2. Outputs -

Reservoir outlet - Sacramento River 13,283,340

3. Net annual N loss - 1,871,205 kg.

* See Working Paper No. 175.

D. Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km²/yr	kg N/km²/yr
Sacramento River	34	1,847
Salt Creek (at C-1)	15	756
McCloud River	11	434
Squaw Creek (at B-1)	18	739
Pit River	21	493

E. Mean Nutrient Concentrations in Ungaged Streams:

Tributary	Mean Total P Conc. (mg/l)	Mean Total N Conc. (mg/l)
Nosoni Creek	0.018	1.365
Squaw Creek (at F-1)	0.019	0.876
Salt Creek (at H-1)	0.022	1.153
Potem Creek	0.018	0.765

F. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	3.05	0.40	95.6	loss*

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Shasta Lake:	
"Dangerous" (eutrophic loading)	1.68
"Permissible" (oligotrophic loading)	0.84

* There was an apparent loss of nitrogen during the sampling year. This may have been due to nitrogen fixation in the reservoir, solubilization of previously sedimented nitrogen, recharge with nitrogen-rich ground water, unsampled point sources discharging directly to the reservoir, or insufficient outlet sampling. Whatever the cause, a similar nitrogen loss has occurred at Shagawa Lake, Minnesota, which has been intensively studied by EPA's former National Eutrophication and Lake Restoration Branch (Malueg et al., 1975).

V. LITERATURE REVIEWED

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VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
0601	AMADOR RESERVOIR	0.040	0.390	408.667	22.383	14.600	0.020
0602	BOCA LAKE	0.012	0.040	372.833	1.700	6.800	0.003
0603	LAKE BRITTON	0.067	0.115	446.500	4.811	11.200	0.047
0604	CASITAS RESERVOIR	0.029	0.050	400.250	3.192	14.000	0.014
0605	CROWLEY LAKE	0.046	0.045	374.750	5.800	12.200	0.034
0606	DON PEDRO RESERVOIR	0.013	0.060	381.733	3.564	11.400	0.004
0607	LAKE ELSINORE	0.469	0.120	489.214	70.572	8.000	0.092
0608	FALLEN LEAF RESERVOIR	0.007	0.040	24.357	0.786	8.800	0.005
0609	LAKE HENNESSEY	0.027	0.060	416.000	4.525	15.000	0.012
0610	LAKE HENSHAW	0.138	0.070	461.000	26.783	9.800	0.073
0611	IRON GATE RESERVOIR	0.184	0.690	440.333	6.217	13.800	0.124
0614	LOPEZ LAKE	0.371	0.090	372.000	8.658	15.000	0.343
0615	LAKE MARY	0.010	0.040	296.000	2.550	10.600	0.002
0616	LAKE MENDOCINO	0.020	0.050	436.500	3.100	9.400	0.008
0617	NICASIO RESERVOIR	0.055	0.345	482.778	6.633	9.800	0.013
0618	LOWER OTAY RESERVOIR	0.058	0.180	447.250	15.933	15.000	0.013
0619	LAKE PILLSBURY	0.022	0.060	466.667	6.389	8.200	0.008
0620	SANTA MARGARITA LAKE	0.037	0.070	400.000	9.122	14.800	0.014
0621	SHASTA LAKE	0.021	0.060	381.542	4.087	9.000	0.015
0622	SHAVER	0.014	0.060	346.400	1.700	7.400	0.004
0623	SILVER LAKE	0.012	0.055	356.000	1.800	7.000	0.003
0624	TULLOCK RESERVOIR	0.025	0.060	433.000	13.878	7.400	0.009
0625	UPPER TWIN LAKES	0.015	0.040	300.200	3.340	7.400	0.004
0626	LOWER TWIN LAKES	0.014	0.040	248.000	2.900	11.400	0.003

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NU
0601	AMADOR RESERVOIR	35 (8)	4 (1)	43 (10)	9 (2)	17 (4)	26 (6)	134
0602	BOCA LAKE	89 (20)	98 (22)	70 (16)	91 (21)	100 (23)	91 (20)	539
0603	LAKE BPITTON	17 (4)	22 (5)	17 (4)	48 (11)	43 (10)	17 (4)	164
0604	CASITAS RESERVOIR	43 (10)	74 (17)	48 (11)	70 (16)	22 (5)	37 (8)	294
0605	CROWLEY LAKE	30 (7)	78 (18)	65 (15)	43 (10)	30 (7)	22 (5)	268
0606	DON PEDRO RESERVOIR	83 (19)	54 (11)	57 (13)	61 (14)	37 (8)	78 (17)	370
0607	LAKE ELSINORE	0 (0)	17 (4)	0 (0)	0 (0)	78 (18)	9 (2)	104
0608	FALLEN LEAF RESERVOIR	100 (23)	87 (19)	100 (23)	100 (23)	70 (16)	70 (16)	527
0609	LAKE HENNESSEY	46 (11)	54 (11)	39 (9)	52 (12)	4 (0)	52 (12)	249
0610	LAKE HENSHAW	13 (3)	33 (7)	13 (3)	4 (1)	54 (12)	13 (3)	130
0611	IRON GATE RESERVOIR	9 (2)	0 (0)	26 (6)	39 (9)	26 (6)	4 (1)	104
0614	LOPEZ LAKE	4 (1)	26 (6)	74 (17)	26 (6)	4 (0)	0 (0)	134
0615	LAKE MARY	96 (22)	87 (19)	91 (21)	83 (19)	48 (11)	100 (23)	505
0616	LAKE MENDOCINO	65 (15)	70 (16)	30 (7)	74 (17)	61 (14)	63 (14)	363
0617	NICASIO RESERVOIR	26 (6)	9 (2)	4 (1)	30 (7)	54 (12)	46 (10)	169
0618	LOWER OTAY RESERVOIR	22 (5)	13 (3)	22 (5)	13 (3)	4 (0)	46 (10)	120
0619	LAKE PILLSBURY	57 (13)	41 (9)	9 (2)	35 (8)	74 (17)	63 (14)	279
0620	SANTA MARGARITA LAKE	39 (9)	33 (7)	52 (12)	22 (5)	13 (3)	37 (8)	196
0621	SHASTA LAKE	61 (14)	54 (11)	61 (14)	57 (13)	65 (15)	30 (7)	328
0622	SHAVER	78 (18)	41 (9)	83 (19)	96 (22)	87 (19)	76 (17)	463
0623	SILVER LAKE	89 (20)	65 (15)	78 (18)	87 (20)	96 (22)	91 (20)	506
0624	TULLOCK RESERVOIR	52 (12)	54 (11)	35 (8)	17 (4)	87 (19)	57 (13)	302
0625	UPPER TWIN LAKES	70 (16)	98 (22)	87 (20)	65 (15)	87 (19)	78 (17)	485
0626	LOWER TWIN LAKES	74 (17)	87 (19)	96 (22)	78 (18)	37 (8)	91 (20)	463

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	0602	BOCA LAKE	539
2	0608	FALLEN LEAF RESERVOIR	527
3	0623	SILVER LAKE	506
4	0615	LAKE MARY	505
5	0625	UPPER TWIN LAKES	485
6	0626	LOWER TWIN LAKES	463
7	0622	SHAVER	463
8	0606	DON PEDRO RESERVOIR	370
9	0616	LAKE MENDOCINO	363
10	0621	SHASTA LAKE	328
11	0624	TULLOCK RESERVOIR	302
12	0604	CASITAS RESERVOIR	294
13	0619	LAKE PILLSBURY	279
14	0605	CROWLEY LAKE	268
15	0609	LAKE HENNESSEY	249
16	0620	SANTA MARGARITA LAKE	196
17	0617	NICASIO RESERVOIR	169
18	0603	LAKE BRITTON	164
19	0614	LOPEZ LAKE	134
20	0601	AMADOR RESERVOIR	134
21	0610	LAKE HENSHAW	130
22	0618	LOWER OTAY RESERVOIR	120
23	0607	LAKE ELSINORE	104
24	0611	IRON GATE RESERVOIR	104

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 - cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR CALIFORNIA 12/07/76

LAKE CODE 0621 SHASTA LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 16630.4

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
0621A1	16630.4	574.83	438.91	212.38	270.43	257.68	262.78	265.61	260.80	197.65	170.75	269.86	370.95	295.38
0621A2	1100.7	98.26	60.31	69.94	59.75	53.24	22.14	9.23	6.54	7.65	9.88	45.59	49.84	40.95
0621C1	35.0	1.671	2.265	1.529	1.642	0.510	0.218	0.113	0.074	0.057	0.173	0.425	1.671	0.854
0621D1	1585.1	79.57	39.36	46.44	34.83	20.93	11.92	9.71	8.44	8.55	9.43	19.20	32.85	26.75
0621F1	158.0	12.29	16.68	11.41	12.20	3.71	1.61	0.85	0.54	0.42	1.27	3.20	12.29	6.31
0621G1	12823.1	311.49	216.34	263.06	241.83	182.64	132.81	107.60	100.24	99.68	106.19	135.07	170.18	172.12
0621ZZ	927.2	94.31	127.86	87.51	93.46	28.42	12.36	6.54	4.16	3.27	9.73	24.51	94.31	48.39

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 16630.4
SUM OF SUB-DRAINAGE AREAS = 16629.1

TOTAL FLOW IN = 3553.99
TOTAL FLOW OUT = 3552.63

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0621A1	11	74	11.582	17	9.430				
	12	74	225.402	15	274.390				
	1	75	15.178	4	10.336				
	2	75	247.489						
	3	75	424.753	2	180.661				
	4	75	162.256	6	123.745				
	5	75	351.129	3	353.960	19	376.614		
	6	75	276.372	8	280.337				
	7	75	269.010	13	257.400				
	8	75	276.089	3	294.495				
	9	75	191.422	7	148.380				
	10	75	193.970	4	193.687				
0621A2	11	74	242.675	17	263.630				
	12	74	17.387	15	10.477				
	1	75	150.646	4	163.955				
	2	75	60.598						
	3	75	112.418	2	178.113				
	4	75	54.652	6	45.873				
	5	75	79.287	3	76.739	19	97.127		
	6	75	44.174	8	63.430				
	7	75	12.459	13	13.366				
	8	75	8.127	3	8.495				
	9	75	7.164	7	7.221				
	10	75	9.826	4	7.023				

TRIBUTARY FLOW INFORMATION FOR CALIFORNIA 12/07/76

LAKE CODE 0621 SHASTA LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0621C1	11	74	0.184	17	0.144				
	12	74	0.266	15	0.153				
	1	75	0.368	4	0.153				
	2	75	2.152						
	3	75	4.078	2	2.350				
	4	75	1.699	6	1.501				
	5	75	0.708	3	1.274	19	0.566		
	6	75	0.283	8	0.311				
	7	75	0.161						
	8	75	0.099	3	0.113				
	9	75	0.074	7	0.074				
	10	75	0.108						
0621D1	11	74	9.741	17	9.373				
	12	74	11.100	15	9.769				
	1	75	9.996						
	2	75	41.343						
	3	75	65.695	2	77.305				
	4	75	32.848	6	28.090				
	5	75	35.962	3	42.758	19	42.758		
	6	75	16.367	8	23.022				
	7	75	11.100	13	10.392				
	8	75	8.891	3	9.203				
	9	75	8.552	7	8.608				
	10	75	8.608	4	7.730				
0621F1	11	74	1.359	17	1.076				
	12	74	1.982	15	1.133				
	1	75	2.690	4	1.133				
	2	75	15.857						
	3	75	30.299	2	17.330				
	4	75	12.544	6	11.185				
	5	75	5.182	2	9.486				
	6	75	2.124	8	2.294				
	7	75	1.189	13	1.133				
	8	75	0.736	3	0.850				
	9	75	0.538	7	0.566				
	10	75	0.793	4	0.453				
0621G1	11	74	119.214	17	115.816				
	12	74	117.232	15	75.889				
	1	75	119.214	4	72.208				
	2	75	197.368						
	3	75	259.948	2	172.733				
	4	75	402.099	6	230.782				
	5	75	1427.169	3	1381.462				
	6	75	1064.713	8	1461.149				
	7	75	156.875						
	8	75	98.543	3	80.137				
	9	75	102.790	7	67.960				
	10	75	117.798	4	145.832				

TRIBUTARY FLOW INFORMATION FOR CALIFORNIA 12/07/76

LAKE CODE 0421 SHASTA LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
062122	11	74	6.938						
	12	74	10.137						
	1	75	13.734						
	2	75	80.986						
	3	75	154.893						
	4	75	63.996						
	5	75	26.476						
	6	75	10.845						
	7	75	6.088						
	8	75	3.738						
	9	75	2.747						
	10	75	4.049						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/09/24

062101
40 43 10.0 122 24 53.0 3
SHASTA LAKE
06089 CALIFORNIA

140991

11EPALES 2111202
0999 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/26	13 30	0000	9.5	11.0	96	107	7.70	59	0.020	0.200K	0.060	0.020K
	13 30	0005	9.5	11.0		106	7.70	61	0.020K	0.200K	0.060	0.021K
	13 30	0015	9.4	11.0		105	7.75	51	0.020K	0.200K	0.070	0.022K
	13 30	0050	9.2	10.8		106	7.70	53	0.020K	0.200K	0.070	0.020J
	13 30	0100	9.2	10.8		105	7.60	53	0.020	0.200K	0.070	0.025K
	13 30	0150	9.1	10.6		107	7.60	55	0.020K	0.200K	0.070	0.021J
	13 30	0200	9.1	10.6		108	7.60	57	0.020	0.200K	0.070	0.027K
	13 30	0240	8.6	10.6		109	7.75	58	0.020K	0.200K	0.090	0.029J
75/07/14	14 00	0000	24.8	8.0	144	97	8.25	51	0.030	0.200	0.040	0.005
	14 00	0005	24.3	8.0		109	8.20	52	0.020	0.200K	0.020K	0.002K
	14 00	0020	23.1	12.0		109	8.20	52	0.020	0.200K	0.020K	0.002K
	14 00	0040	15.6	8.2		97	7.70	57	0.030	0.200K	0.020K	0.015
	14 00	0080	12.3	8.8		90	7.70	54	0.020	0.200K	0.030	0.018
	14 00	0125	9.4	9.8		74	7.70	54	0.030	0.200K	0.070	0.016
	14 00	0175	8.4	9.8		68	7.70	53	0.020	0.200K	0.080	0.016
75/11/03	08 45	0000	17.3	8.6	204	87	7.80	49	0.020K	0.200K	0.020K	0.013
	08 45	0005	17.3	8.8		89	7.80	61	0.020K	0.200K	0.020K	0.016
	08 45	0045	17.3	8.2		89	7.80	59	0.020K	0.200K	0.020K	0.014
	08 45	0090	17.3	8.0		87	7.80	59	0.020K	0.200K	0.020K	0.015
	08 45	0140	15.8	7.2		77	7.60	51	0.020K	0.200K	0.040	0.026
	08 45	0175	14.7	7.6		75	7.30	53	0.020K	0.200K	0.070	0.028

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 76/09/24

062101
40 43 10.0 122 24 53.0 3
SHASTA LAKE
06089 CALIFORNIA
140991

11EPALES 2111202
0999 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/26	13	30 0000	0.019	1.3	
	13	30 0005	0.020		
	13	30 0015	0.019		
	13	30 0050	0.022		
	13	30 0100	0.019		
	13	30 0150	0.021		
	13	30 0200	0.024		
	13	30 0240	0.031		
75/07/14	14	00 0000	0.010	0.8	
	14	00 0005	0.007		
	14	00 0020	0.006		
	14	00 0040	0.024		
	14	00 0080	0.024		
	14	00 0125	0.022		
	14	00 0175	0.021		
75/11/03	08	45 0000	0.021	2.0	
	08	45 0005	0.023		
	08	45 0045	0.021		
	08	45 0090	0.020		
	08	45 0140	0.031		
	08	45 0175	0.034		

STORET RETRIEVAL DATE 76/09/24

062102
40 44 55.0 122 23 51.0 3
SHASTA LAKE
06089 CALIFORNIA

140991

11EPALES 2111202
0999 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/26	14	40 0000	9.5	11.0	102	107	7.90	54	0.020	0.200K	0.060	0.021J
	14	40 0005	9.6	11.0		110	7.90	52	0.020K	0.200K	0.060	0.019J
	14	40 0020	9.3	10.8		105	7.90	51	0.020	0.200K	0.060	0.027K
	14	40 0050	9.1	10.8		108	7.80	53	0.020	0.200K	0.060	0.022J
	14	40 0100	9.1	10.8		110	7.90	54	0.020K	0.200K	0.060	0.018J
	14	40 0150	9.0	10.8		133	8.00	54	0.020K	0.200K	0.060	0.022J
	14	40 0200	8.8	10.8		108	7.80	55	0.020K	0.200K	0.080	0.024J
	14	40 0240	8.3	10.6		137	7.80	58	0.020K	0.200K	0.100	0.030J
75/07/14	14	30 0000	24.6	8.4	132	123	8.20	53	0.020	0.200K	0.020	0.002K
	14	30 0005	24.5	7.8		108	8.25	52	0.020	0.200K	0.020K	0.002K
	14	30 0015	23.5	8.2		106	8.20	52	0.030	0.200K	0.020K	0.002K
	14	30 0025	20.4	8.0		104	7.80	53	0.040	0.200K	0.020K	0.003
	14	30 0045	15.7	7.4		102	7.70	62	0.020	0.200K	0.020K	0.026
	14	30 0085	11.9	9.2		84	7.70	56	0.020	0.200K	0.030	0.017
	14	30 0125	9.3	9.8		81	7.70	55	0.030	0.200K	0.070	0.018
	14	30 0175	8.2	8.0		76	7.70	55	0.020	0.200K	0.080	0.017
75/11/03	09	15 0000	17.3	8.4	240	89	7.65	55	0.020K	0.200K	0.020K	0.015
	09	15 0005	17.3	7.8		89	7.70	51	0.020K	0.200K	0.020K	0.015
	09	15 0030	17.3	8.0		89	7.70	53	0.020K	0.200K	0.020K	0.014
	09	15 0054	17.3	8.0		89	7.70	54	0.020K	0.200K	0.020K	0.015
	09	15 0090	17.2	8.0		89	7.70	56	0.020K	0.200K	0.020K	0.018
	09	15 0140	15.7	8.2		77	7.60	53	0.020K	0.200K	0.040	0.026
	09	15 0175	14.9	7.8		81	7.50	56	0.020K	0.200K	0.080	0.035

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 76/09/24

062102
40 44 55.0 122 23 51.0 3
SHASTA LAKE
06089 CALIFORNIA
140991

11EPALES 2111202
0949 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/26	14 40	0000	0.025	1.6	
	14 40	0005	0.021		
	14 40	0020	0.021		
	14 40	0050	0.022		
	14 40	0100	0.022		
	14 40	0150	0.022		
	14 40	0200	0.025		
	14 40	0240	0.033		
75/07/14	14 30	0000	0.007	0.7	
	14 30	0005	0.006		
	14 30	0015	0.006		
	14 30	0025	0.008		
	14 30	0045	0.033		
	14 30	0085	0.023		
	14 30	0125	0.023		
	14 30	0175	0.022		
75/11/03	09 15	0000	0.020	17.0	
	09 15	0005	0.021		
	09 15	0030	0.021		
	09 15	0054	0.020		
	09 15	0090	0.021		
	09 15	0140	0.029		
	09 15	0175	0.034		

STORET RETRIEVAL DATE 76/09/24

052103
40 46 50.0 122 22 50.0 3
SHASTA LAKE
06089 CALIFORNIA
140991

11EPALES 2111202
0999 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/26	15 30	0000	9.4	11.0	78	104	7.95	53	0.020	0.200K	0.040	0.009J
	15 30	0005	9.4	10.9		119	8.05	55	0.020	0.200K	0.040	0.009J
	15 30	0015	9.3	11.0		100	8.00	54	0.020	0.200K	0.040	0.016J
	15 30	0050	9.1	10.8		107	7.95	56	0.020	0.200K	0.040	0.010J
	15 30	0100	9.1	11.0		116	7.90	57	0.020	0.200K	0.040	0.010J
	15 30	0150	9.0	10.7		101	7.80	58	0.020K	0.200K	0.060	0.014J
	15 30	0200	8.5	10.6		106	7.70	57	0.020K	0.200K	0.080	0.026J
	15 30	0240	8.2	10.8		112	7.75	57	0.020K	0.200K	0.100	0.023J
75/07/14	14 35	0000	25.0	8.0	120	133	8.20	53	0.030	0.200K	0.020	0.005
	14 35	0005	24.6	7.8		123	8.75	53	0.030	0.200K	0.020K	0.004
	14 35	0025	20.1	7.8		112	7.90	52	0.030	0.200K	0.020K	0.010
	14 35	0050	14.3	9.0		108	7.65	57	0.030	0.200K	0.030	0.027
	14 35	0100	9.8	9.4		80	7.65	47	0.020	0.200K	0.040	0.016
	14 35	0150	7.7	9.8		80	7.65	51	0.020	0.200K	0.070	0.018
	14 35	0220	6.5	9.8		73	7.60	47	0.020K	0.200K	0.080	0.015
75/11/03	10 45	0000	17.3	8.2	206	110	7.80	59	0.020K	0.200K	0.020K	0.012
	10 45	0005	17.3	8.0		110	7.80	60	0.020K	0.200K	0.020K	0.012
	10 45	0025	17.3	8.2		108	7.80	60	0.020K	0.200K	0.020K	0.012
	10 45	0060	17.2	9.2		109	7.80	62	0.020K	0.200K	0.020K	0.013
	10 45	0100	17.2	8.0		86	7.70	62	0.020K	0.200K	0.020K	0.014
	10 45	0145	15.0	7.7		85	7.55	56	0.020K	0.200K	0.040	0.021
	10 45	0190	13.7	7.8		92	7.45	62	0.020K	0.200K	0.080	0.024
	10 45	0230	11.0	8.0		66	7.40	37	0.020K	0.200K	0.080	0.013

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 76/09/24

052103
40 46 50.0 122 22 50.0 3
SHASTA LAKE
06059 CALIFORNIA
140991

11EPALES 2111202
0999 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/26	15 30	0000	0.021	3.0	
	15 30	0005	0.022		
	15 30	0015	0.020		
	15 30	0050	0.021		
	15 30	0100	0.021		
	15 30	0150	0.024		
	15 30	0200	0.030		
	15 30	0240	0.034		
75/07/14	14 35	0000	0.008	0.8	
	14 35	0005	0.007		
	14 35	0025	0.011		
	14 35	0050	0.032		
	14 35	0100	0.019		
	14 35	0150	0.021		
	14 35	0220	0.018		
75/11/03	10 45	0000	0.020	29.0	
	10 45	0005	0.020		
	10 45	0025	0.020		
	10 45	0060	0.021		
	10 45	0100	0.021		
	10 45	0145	0.026		
	10 45	0190	0.029		
	10 45	0230	0.018		

STORET RETRIEVAL DATE 76/09/24

062104
40 51 03.0 122 23 53.0 3
SHASTA LAKE
06089 CALIFORNIA

140991

11EPALES 2111202
0060 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/27	10 00	0000	8.8	11.4	48	80	7.60	51	0.020	0.200K	0.030	0.009
	10 00	0005	8.4	11.4		77	7.60	38	0.020K	0.200K	0.020	0.012
	10 00	0015	8.8	11.4		77	7.60	37	0.020	0.200K	0.020	0.008
	10 00	0030	8.9	11.2		77	7.60	35	0.020K	0.200K	0.020	0.015
	10 00	0055	8.7	9.2		73	7.55	52	0.020K	0.200K	0.020	0.011
75/07/14	13 55	0000	25.3	7.6	60	127	8.00	49	0.060	0.700	0.040	0.011
	13 55	0005	25.1	8.0		125	8.10	47	0.030	0.200K	0.020K	0.005
	13 55	0015	21.8	7.8		113	7.90	41	0.030	0.200K	0.020K	0.006
	13 55	0050	14.1	8.6		79	7.60	40	0.030	0.200K	0.020K	0.007
	13 55	0080	11.2	8.6		66	7.50	41	0.040	0.200K	0.040	0.016
	13 55	0114	9.2	8.0		72	7.50	42	0.020	0.200K	0.050	0.011
75/11/03	10 10	0000	17.1	8.0	192	106	7.60	65	0.020K	0.200K	0.020K	0.006
	10 10	0005	17.0	8.0		106	7.60	64	0.020K	0.200K	0.020K	0.006
	10 10	0025	17.0	8.0		106	7.60	64	0.020K	0.200K	0.020K	0.006
	10 10	0065	16.9	8.0		103	7.60	62	0.020K	0.200K	0.020K	0.004
	10 10	0100	16.4	8.2		98	7.60	58	0.020K	0.200K	0.020K	0.003
	10 10	0140	14.9	8.6		101	7.60	57	0.020K	0.200K	0.020K	0.004

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

062104
40 51 03.0 122 23 53.0 3
SHASTA LAKE
06089 CALIFORNIA
140991

11EPALES 2111202
0060 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/27	10 00	0000	0.016	3.3	
	10 00	0005	0.017		
	10 00	0015	0.022		
	10 00	0030	0.018		
	10 00	0055	0.018		
75/07/14	13 55	0000	0.015	1.0	
	13 55	0005	0.009		
	13 55	0015	0.009		
	13 55	0050	0.010		
	13 55	0080	0.018		
	13 55	0114	0.016		
75/11/03	10 10	0000	0.013	1.9	
	10 10	0005	0.014		
	10 10	0025	0.013		
	10 10	0065	0.011		
	10 10	0100	0.010		
	10 10	0140	0.018		

STORET RETRIEVAL DATE 76/09/24

062105
40 47 40.0 122 17 37.0 3
SHASTA LAKE
06049 CALIFORNIA
140991

11EPALES 2111202
0225 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/27	10 40	0000	9.1	11.4	72	103	7.90	49	0.020	0.200K	0.040	0.017
	10 40	0005	9.3	11.2		101	7.90	50	0.020K	0.200K	0.030	0.017
	10 40	0015	9.2	11.2		102	7.90	50	0.020K	0.200K	0.030	0.017
	10 40	0050	9.2	11.4		103	8.00	48	0.020K	0.200K	0.030	0.012
	10 40	0100	9.1	11.0		107	7.95	49	0.020K	0.200K	0.040	0.011
	10 40	0150	9.1	11.2		115	7.90	51	0.020K	0.200K	0.510	0.023
	10 40	0180	9.0	11.0		119	7.80	54	0.040	0.200K	0.100	0.040
	10 40	0210	8.8	11.0		121	7.80	54	0.030	0.200K	0.100	0.046
	10 40	0220	8.7	11.0		121	7.75	54	0.030	0.200K	0.100	0.047
75/07/14	11 45	0000	24.1	8.2	72	132	8.30	57	0.020	0.800	0.030	0.009
	11 45	0005	23.8	6.0		125	8.30	58	0.020	0.300	0.020	0.003
	11 45	0025	19.4	7.8		106	7.95	53	0.030	0.200	0.020K	0.014
	11 45	0050	14.6	9.0		102	7.70	58	0.030	0.200K	0.030	0.035
	11 45	0100	9.7	9.2		88	7.70	53	0.030	0.200K	0.060	0.024
	11 45	0150	7.8	9.4		84	7.70	51	0.020	0.200K	0.070	0.020
	11 45	0216	6.7	9.6		82	7.60	50	0.020	0.200K	0.090	0.019
75/11/03	09 35	0000	17.2	8.2	204	109	7.80	65	0.020K	0.200K	0.020K	0.002K
	09 35	0005	17.2	8.2		110	7.80	65	0.020K	0.200K	0.020K	0.009
	09 35	0035	17.2	8.0		110	7.75	59	0.020K	0.200K	0.020K	0.012
	09 35	0080	17.2	8.4		106	7.70	56	0.020K	0.200K	0.020K	0.010
	09 35	0120	16.0	6.8		97	7.55	58	0.020K	0.200K	0.040	0.016
	09 35	0160	14.3	7.6		96	7.50	61	0.020K	0.200K	0.080	0.028
	09 35	0195	13.5	8.6		103	7.50	69	0.020K	0.200K	0.090	0.028
	09 35	0230	11.4	7.4		75	7.40	57	0.020K	0.200K	0.100	0.017

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

062105
40 47 40.0 122 17 37.0 3
SHASTA LAKE
06089 CALIFORNIA
140991

11EPALES 2111202
0225 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/27	10 40	0000	0.021	2.5	
	10 40	0005	0.018		
	10 40	0015	0.019		
	10 40	0050	0.019		
	10 40	0100	0.021		
	10 40	0150	0.030		
	10 40	0180	0.050		
	10 40	0210	0.050		
	10 40	0220	0.050		
75/07/14	11 45	0000	0.015	0.8	
	11 45	0005	0.007		
	11 45	0025	0.016		
	11 45	0050	0.035		
	11 45	0100	0.026		
	11 45	0150	0.039		
	11 45	0216	0.028		
75/11/03	09 35	0000	0.017	2.7	
	09 35	0005	0.016		
	09 35	0035	0.017		
	09 35	0080	0.017		
	09 35	0120	0.020		
	09 35	0160	0.034		
	09 35	0195	0.037		
	09 35	0230	0.022		

STORET RETRIEVAL DATE 76/09/24

062106
40 45 35.0 122 15 02.0 3
SHASTA LAKE
06089 CALIFORNIA

1-0991

11EPALES 2111202
0195 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/27	09	35 0000	8.6	11.2	60	84	8.00	55	0.040	0.300	0.040	0.016
	09	35 0005	8.6	10.6		82	8.10	55	0.020	0.200K	0.030	0.010
	09	35 0015	8.6	11.2		83	8.10	56	0.020K	0.200K	0.020	0.009
	09	35 0050	8.6	11.2		83	8.20	54	0.020	0.200K	0.020	0.010
	09	35 0090	8.6	11.2		82	8.15	52	0.020	0.200K	0.020	0.011
	09	35 0140	8.2	11.2		87	7.95	57	0.050	0.200	0.080	0.035
	09	35 0191	8.0	11.2		87	7.90	53	0.040	0.200K	0.080	0.031
75/07/14	11	10 0000	25.1	8.4	108	145	8.50	58	0.020K	0.200K	0.020	0.005
	11	10 0005	24.8	8.4		134	8.50	58	0.020K	0.200K	0.020K	0.005
	11	10 0020	21.6	8.0		118	8.00	68	0.020K	0.200K	0.040	0.037
	11	10 0050	14.1	8.4		114	7.70	68	0.020K	0.200K	0.050	0.041
	11	10 0100	9.8	9.2		92	7.60	60	0.020K	0.200K	0.060	0.027
	11	10 0150	7.6	9.2		95	7.60	62	0.020K	0.200K	0.090	0.029
	11	10 0270	6.3	9.0		98	7.60	64	0.020K	0.200K	0.110	0.023
75/11/03	09	50 0000	17.4	8.8	144	93	7.70	58	0.020K	0.200K	0.020K	0.012
	09	50 0005	17.4	8.4		93	7.80	58	0.020K	0.200K	0.020K	0.012
	09	50 0040	17.4	7.8		93	7.80	61	0.020K	0.200K	0.020K	0.012
	09	50 0090	17.3	7.6		93	7.70	59	0.020K	0.200K	0.030	0.016
	09	50 0140	15.6	7.8		113	7.60	64	0.020K	0.200K	0.080	0.028
	09	50 0175	14.6	8.8		121	7.60	68	0.020K	0.200K	0.080	0.023

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

062106
40 45 35.0 122 15 02.0 3
SHASTA LAKE
06089 CALIFORNIA
140991

11EPALES 2111202
0195 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/27	09	35 0000	0.031	5.9	
	09	35 0005	0.028		
	09	35 0015	0.024		
	09	35 0050	0.025		
	09	35 0090	0.029		
	09	35 0140	0.059		
	09	35 0191	0.056		
75/07/14	11	10 0000	0.012	1.4	
	11	10 0005	0.010		
	11	10 0020	0.043		
	11	10 0050	0.043		
	11	10 0100	0.032		
	11	10 0150	0.033		
	11	10 0270	0.029		
75/11/03	09	50 0000	0.020	4.0	
	09	50 0005	0.021		
	09	50 0040	0.022		
	09	50 0090	0.026		
	09	50 0140	0.038		
	09	50 0175	0.042		

STORET RETRIEVAL DATE 76/09/24

062107
40 46 40.0 122 13 30.0 3
SHASTA LAKE
06089 CALIFORNIA
140991

11EPALES 2111202
016 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/27	09	00 0000	8.7	11.2	51	81	8.20	54	0.040	0.600	0.020	0.010
	09	00 0005	8.7	11.2		82	8.20	53	0.030	0.200K	0.020	0.011
	09	00 0015	8.7	11.2		81	8.20	51	0.020	0.200K	0.020K	0.010
	09	00 0060	8.7	11.2		82	8.10	48	0.020	0.200	0.030	0.024
	09	00 0110	8.4	11.0		81	8.00	47	0.030	0.300	0.030	0.017
	09	00 0160	7.6	11.4		76	7.90	47	0.030	0.300	0.060	0.028
75/11/03	10	20 0000	17.6	8.0	156	93	7.75	66	0.020K	0.200K	0.020K	0.011
	10	20 0005	17.5	8.2		93	7.80	64	0.020K	0.200K	0.020K	0.011
	10	20 0045	17.4	8.0		95	7.80	58	0.020K	0.200K	0.020K	0.031
	10	20 0090	17.3	8.0		93	7.80	58	0.020K	0.200K	0.020K	0.015
	10	20 0125	16.5	6.6		93	7.60	61	0.020K	0.200K	0.080	0.035
	10	20 0161	14.9	8.0		97	7.60	62	0.020K	0.200K	0.100	0.024

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/27	09	00 0000	0.031	4.8	
	09	00 0005	0.027		
	09	00 0015	0.028		
	09	00 0060	0.035		
	09	00 0110	0.037		
	09	00 0160	0.066		
75/11/03	10	20 0000	0.020	2.5	
	10	20 0005	0.023		
	10	20 0045	0.021		
	10	20 0090	0.022		
	10	20 0125	0.077		
	10	20 0161	0.038		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

062108
40 47 32.0 122 10 30.0 3
SHASTA LAKE
06089 CALIFORNIA

11EPALES 760109 2111202
0190 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/07/14	10 30	0000	25.3	8.0	66	148	8.40	61	0.030	0.600	0.040	0.003
	10 30	0005	25.1	8.0		139	8.50	60	0.020	0.200	0.020K	0.002K
	10 30	0015	21.6	8.8		121	8.30	56	0.020	0.200K	0.020K	0.006
	10 30	0040	15.3	6.8		109	7.60	61	0.020	0.200K	0.060	0.023
	10 30	0100	9.2	8.2		104	7.60	78	0.020	0.200K	0.080	0.025
	10 30	0150	7.6	8.2		100	7.50	64	0.020	0.200K	0.100	0.023
	10 30	0186	7.0	7.8		97	7.05	63	0.030	0.200K	0.120	0.023
75/11/03	11 30	0000	17.4	8.4	96	95	7.80	63	0.020K	0.200K	0.020K	0.006
	11 30	0005	17.3	8.4		97	7.80	65	0.020K	0.200K	0.020K	0.005
	11 30	0034	17.2	8.4		97	7.80	65	0.020K	0.200K	0.020K	0.003
	11 30	0065	17.2	8.0		97	7.70	69	0.020K	0.200K	0.030	0.003
	11 30	0100	16.4	8.2		97	7.80	68	0.020K	0.200K	0.020K	0.002
	11 30	0135	16.4	8.4		101	7.70	69	0.020K	0.200K	0.020K	0.003

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/07/14	10 30	0000	0.015	1.4	
	10 30	0005	0.011		
	10 30	0015	0.013		
	10 30	0040	0.034		
	10 30	0100	0.029		
	10 30	0150	0.027		
	10 30	0186	0.029		
75/11/03	11 30	0000	0.017	3.8	
	11 30	0005	0.017		
	11 30	0034	0.015		
	11 30	0065	0.013		
	11 30	0100	0.012		
	11 30	0135	0.035		

K VALUE SHOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

062109
40 45 05.0 122 08 38.0 3
SHASTA LAKE
06089 CALIFORNIA

11EPALES 760109 2111202
0210 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/07/14	09 40	0000	24.8	8.2	72	142	8.80	60	0.030	0.600	0.030	0.005
	09 40	0005	24.8	9.0		134	8.80	60	0.020	0.200K	0.020K	0.002
	09 40	0015	22.4	7.8		121	8.40	61	0.030	0.300	0.020	0.009
	09 40	0040	15.0	8.6		121	8.10	70	0.030	0.200K	0.030	0.033
	09 40	0100	9.6	8.8		92	7.65	60	0.030	0.200K	0.070	0.027
	09 40	0150	7.8	8.8		98	7.60	62	0.020	0.200	0.110	0.025
	09 40	0206	7.0	6.8		96	7.40	64	0.030	0.200K	0.170	0.025
75/11/03	11 50	0000	17.5	8.0	120	95	7.70	58	0.020K	0.200K	0.030	0.012
	11 50	0005	17.5	9.8		93	7.80	59	0.020K	0.200K	0.020	0.011
	11 50	0037	17.4	8.6		93	7.80	59	0.020K	0.200K	0.020K	0.011
	11 50	0080	17.4	7.6		93	7.70	59	0.020K	0.200K	0.020	0.013
	11 50	0125	15.1	8.8		91	7.70	65	0.020K	0.200K	0.060	0.026
	11 50	0175	13.7	9.6		91	7.80	67	0.020K	0.200K	0.070	0.030

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/07/14	09 40	0000	0.019	2.5	
	09 40	0005	0.016		
	09 40	0015	0.022		
	09 40	0040	0.045		
	09 40	0100	0.037		
	09 40	0150	0.040		
	09 40	0206	0.048		
75/11/03	11 50	0000	0.022	3.4	
	11 50	0005	0.021		
	11 50	0037	0.020		
	11 50	0080	0.023		
	11 50	0125	0.038		
	11 50	0175	0.052		

A VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/09/24

0621A1
40 43 00.0 122 25 25.0 4
SACRAMENTO RIVER
06 7.5 SHASTA DAM
0/SHASTA LAKE 140991
SHASTA DAM ACCESS RD BRDG .2 M BELO DAM
11EPALES 211120
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	09 45		0.080	0.750	0.025	0.025	0.025
74/12/15	10 03		0.088	0.900	0.008	0.025	0.030
75/01/04	10 00		0.096	0.900	0.010	0.030	0.050
75/03/02	09 00			0.500			0.030
75/04/06	09 00		0.100	1.100	0.015	0.025	0.025
75/05/03	11 00		0.090	2.300	0.025	0.030	0.050
75/05/19	09 00		0.130	2.400	0.060	0.030	0.040
75/06/08	09 20		0.100	3.000	0.040	0.020	0.020
75/07/13	09 00		0.095	0.500	0.010	0.020	0.020
75/08/03	11 00		0.095	0.400	0.015		0.045
75/09/07	11 00		0.090	0.800	0.015	0.022	0.040
75/10/04	12 00		0.075	1.600	0.030	0.020	0.030

STORET RETRIEVAL DATE 76/09/24

0621A2
40 56 20.0 122 24 40.0 4
SACRAMENTO RIVER
06 SHASTA CO HWY MP
T/SHASTA LAKE 140991
BNR. 100 FT E I-5 .2 MI S OF DELTA
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	11	30	0.056	0.700	0.030	0.030	0.030
74/12/15	11	25	0.038	1.550	0.037	0.022	0.022
75/01/04	12	30	0.120	0.900	0.020	0.025	0.030
75/03/02	11	00	0.050	0.900	0.030	0.010	0.070
75/04/06	09	45	0.025	0.600	0.015	0.010	0.010
75/05/03	13	00	0.015	0.050K	0.005	0.010	0.030
75/05/19	12	00	0.060	5.000	0.113	0.005	0.030
75/06/08	11	00	0.030	3.300	0.115	0.005	0.010
75/07/13	10	30	0.025	0.300	0.020	0.015	0.020
75/08/03	09	00	0.015	2.800	0.055	0.020	0.050
75/09/07			0.015	0.200	0.005	0.030	0.060
75/10/04	15	30	0.010	2.200	0.030	0.020	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

0621B1
40 -- 25.0 122 28 05.0 4
SQUAW CREEK
06 7.5 SHASTA DAM
T/SHASTA LAKE 140991
WESTSIDE RD BRDG 4 MI NW OF SHASTA DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	10 15		0.024	0.500	0.040	0.005	0.010K
74/12/15	10 20		0.024	0.100K	0.013	0.005K	0.010K
75/01/04	09 45		0.040	0.100K	0.030	0.005K	0.010K
75/03/02	09 30		0.015	0.350	0.005	0.005K	0.020
75/04/06	09 20		0.020	0.050K	0.045	0.005K	0.010K
75/05/03	10 15		0.020	1.600	0.055	0.005K	0.030
75/05/19	09 30		0.030	0.700	0.050	0.005K	0.020
75/06/08	08 00		0.030	0.900	0.060	0.005K	0.010K
75/07/13	09 45		0.035	1.700	0.055	0.005K	0.010
75/08/03	12 09		0.030	0.100K	0.035	0.010	0.010
75/09/07	11 30		0.045	0.100K	0.045	0.015	0.020
75/10/04	10 30		0.035	0.500	0.015	0.005	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/04/24

0621C1
40 51 30.0 122 18 45.0 4
SALT CREEK
06 SHASTA CO HWY MP
T/SHASTA LAKE 140991
GILMAN RD BRDG 2 MI E OF SALT CRK LODGE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	12 05		0.008	0.500	0.015	0.005	0.010K
74/12/15	11 55		0.016	0.650	0.006	0.015	0.015
75/01/04	11 30		0.056	1.200	0.017	0.005	0.010K
75/03/02	12 00		0.040	0.700	0.015	0.010	0.020
75/04/06	10 15		0.015	0.950	0.005	0.015	0.015
75/05/03	12 00		0.010	2.800	0.035	0.015	0.040
75/05/19			0.025	0.400	0.015	0.010	0.010
75/06/08	10 30		0.020	1.100	0.025	0.010	0.030
75/08/03	09 10		0.015	0.500	0.015	0.010	0.020
75/09/07	11 15		0.020	0.800	0.015	0.015	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/09/24

04101
40 56 25.0 122 14 45.0 4
MCCLOUD RIVER
06 15 BOLLIBOKKA MT
T/SHASTA LAKE 140991
SEC RD BRDG .2 M N MCCLOUD BRDG GRD STA
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	12	50	0.024	0.600	0.035	0.020	0.020
74/12/15	11	50	0.056	1.500	0.016	0.020	0.020
75/03/02	12	40	0.035	0.800	0.010	0.010	
75/04/06	11	15	0.015	0.900	0.065	0.010	0.010
75/05/03	11	35	0.010	0.600	0.015	0.010	0.040
75/05/19			0.055	0.100K	0.005K	0.010	0.020
75/06/08	09	30	0.005	0.100K	0.005	0.010	0.010
75/07/13	14	00	0.020	0.500	0.020	0.010	0.015
75/08/03	09	40	0.010	0.200	0.020	0.005K	0.010
75/09/07			0.015	0.100K	0.005	0.020	0.040
75/10/04	09	00	0.015	3.300	0.040	0.015	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

0621E1
40 54 40.0 122 12 30.0 4
NOSONI CREEK
06 15 BULLIBOKKA MT
T/SHASTA LAKE 140991
SEC RD BRDG 2.4 MI SE OF POINT MCCLOUD
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	13 20		0.024	0.500	0.025	0.005	0.010K
74/12/15	12 40		0.032	1.800	0.022	0.007	0.010
75/01/04	10 15		0.080	1.200	0.020	0.005	0.010K
75/03/02	13 00		0.030	1.300	0.015	0.010	0.020
75/04/06	12 00		0.010	0.550	0.005	0.010	0.020
75/05/03	13 15		0.010	1.800	0.025	0.010	0.020
75/06/08	10 30		0.045	0.100K	0.005K	0.010	0.010
75/07/13	12 15		0.065	4.300	0.110	0.010	0.030
75/08/03	10 00		0.075	0.800	0.045	0.010	0.010
75/09/07	12 30		0.095	1.000	0.022	0.015	0.030
75/10/04	09 30		0.095	1.100	0.025	0.010	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

0621F1
40 52 25.0 122 07 00.0 4
SQUAW CREEK
05 15 BOLLIBOKKA MT
T/SHASTA LAKE 140991
BRDG ON SEC RD 7.5 MI N OF INGOT
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	14 40		0.008	0.400	0.015	0.015	0.015
74/12/15	13 45		0.008	2.600	0.032	0.010	0.010
75/01/04	11 25		0.080	0.500	0.025	0.005	0.010K
75/03/02	14 00		0.015	0.150	0.010	0.015	0.030
75/04/06	13 30		0.010	0.875	0.020	0.015	0.015
75/05/02			0.010	1.680	0.020	0.010	0.035
75/06/08	13 00		0.010	0.100K	0.005K	0.015	0.020
75/07/13	13 30		0.005	0.300	0.140	0.010	0.020
75/08/03	10 40		0.015	1.200	0.022	0.010	0.010
75/09/07	10 45		0.015	0.650	0.015	0.010	0.020
75/10/04	11 00		0.010	1.000	0.025	0.010	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

062131
40 50 25.0 122 01 00.0 4
PIT RIVER
06 15 BOLLIBOKKA MT
T/SHASTA LAKE 140991
SEC RD BRDG .6 MI F OF POTEM FALLS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	15 50		0.080	0.600	0.070	0.045	0.045
74/12/15	14 40		0.124	3.250	0.032	0.040	0.050
75/01/04	13 45		0.112	0.600	0.010	0.040	0.040
75/03/02	14 50		0.115	1.150	0.020	0.050	0.060
75/04/06	15 30		0.075	0.300	0.010	0.040	0.040
75/05/03			0.035	1.100	0.035	0.035	0.060
75/06/08	14 30		0.020	0.100	0.005	0.030	0.050
75/08/07	11 30		0.030	1.800	0.025	0.030	0.040
75/09/07	09 15		0.015	0.100	0.010	0.035	0.060
75/10/04	15 00		0.045	2.000	0.030	0.035	0.060

STORET RETRIEVAL DATE 76/09/24

06214-1
40 51 55.0 122 08 22.0 4
SALT CREEK
06 15 BOLLIBOKKA MT
T/SHASTA LAKE 140991
SEC RD XING 2.5 MI # SQUAW CRK FR CON ST
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	13 55		0.008	1.050	0.025	0.015	0.015
74/12/15	13 30		0.016	1.250	0.013	0.015	0.017
75/01/04	11 00		0.048	0.800	0.010		0.010
75/03/02	13 30		0.035	1.250	0.025	0.015	0.030
75/04/06	13 00		0.015	0.850	0.010	0.010	0.010
75/05/03			0.010	1.750	0.027	0.010	0.020
75/08/07	10 25		0.060	0.100K	0.015	0.020	0.020
75/09/07	11 20		0.095	2.200	0.025	0.025	0.040
75/10/04			0.040	0.800	0.015	0.020	0.040

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

0621J1
40 51 20.0 122 02 05.0 4
POTEM CREEK
06 15 BOLLIBOKKA MT
T/SHASTA LAKE 140991
SEC RD XING 1.3 MI N OF POTEM FALLS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	15	25	0.008	0.302	0.012	0.010	0.010
74/12/15	14	30	0.016	1.700	0.032	0.010	0.020
75/01/04	13	00	0.088		0.050	0.010	
75/03/02	14	20	0.030	0.400	0.015	0.015	0.030
75/04/06	14	30	0.020	0.950	0.055	0.010	0.010
75/05/03			0.010	0.450	0.110	0.015	0.020
75/06/08	13	45	0.030	0.100K	0.005K	0.015	0.020
75/08/07	11	10	0.015	0.200	0.080	0.015	0.015
75/09/07			0.040	1.000	0.030	0.015	0.020
75/10/04	13	00	0.010	1.200	0.015	0.010	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

0621AA P0621AA P002800
41 11 00.0 122 16 50.0 4
DUNSMUIR
06 15 DUNSMUIR
T/LAKE SHASTA 140992
SACRAMENTO RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/01/27	13	30	0.080	18.000	7.400	4.600	5.900	0.261	
75/03/04	11	00	0.080	5.000	1.900	1.750	2.100	0.737	
75/03/31	11	00	0.080	4.400	1.800	1.120	1.800	0.710	
75/04/29	08	30	0.050	12.000	2.000	2.700	3.850	0.452	0.451
75/05/27	09	00	0.050	9.900	4.500	4.100	4.600	0.472	0.470
75/06/26	13	30	0.075	15.500	7.700	4.700	5.900	0.302	0.388
75/07/28	13	30	0.025	12.500	4.800	4.900	6.100		
75/08/28	13	30	0.050	14.000	9.400	5.900	6.300	0.316	0.301
75/10/07	13	30	0.075	20.000	5.000	5.600	6.900	0.250	0.500
75/11/13	13	10	10.500	4.000	1.200	4.700	4.900	0.300	0.300
75/12/10	00	00	10.500	3.000	0.069	4.400	5.200		
76/01/13	00	00	1.650	3.800	0.330	4.300	4.800		
76/03/05	00	00	6.000	1.000K	0.070	2.300	2.500		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

0621AB 0621AB P003000
41 17 00.0 122 19 15.0 4
MT. SHASTA
06 15 WEED
T/LAKE SHASTA 140192
SACRAMENTO RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/05/07	16	00	0.200	6.200	0.450	2.100	3.000	0.264	0.470
75/06/06	14	00	0.300	9.700	0.990	3.300	4.100	0.354	0.380
75/06/30	09	00	0.250	6.600	0.950	3.300	4.000	0.459	0.400
75/08/07	09	00	0.450	9.000	0.220	3.600	4.000	0.389	0.400
75/08/19	11	00	0.175	9.800	0.410	3.400	4.500	0.459	0.400
75/09/25	10	00	0.375	7.800	0.220	3.000	3.600	0.446	0.511
75/10/20	11	20	0.275	7.700	0.230	2.100	2.900	0.459	0.539
75/11/26	10	00	0.350	6.500	0.570	1.570	2.300	0.560	0.500
75/12/18	10	30	0.125	10.000	1.800	2.000	3.200	0.500	0.500
76/01/26	11	00	0.075	7.700	1.650	2.100	2.800	0.500	0.500
76/02/17	11	00	0.100	9.800	1.300	1.950	2.900	0.500	0.500
76/03/05	21	00	0.260	8.000	0.600	1.500	2.400	0.886	0.600
76/04/02	11	00	0.275	10.000	3.650	1.975	2.900	0.741	0.900